

## REMARKS

Applicants now request continued examination of the application as hereby amended and submit that the claims presented are directed to the same invention as previously claimed and are allowable over the prior art of record, the most relevant prior art as known to Applicants.

Claims 1-27 and 32 are rejected. Claims 1, 9, 26-27 and 32 have been amended. Claims 28-31 have been withdrawn from further consideration. Claims 1-31 are presently pending in the application. Favorable reconsideration of the application in view of the following remarks is respectfully requested.

The basis for the amendment to claims 1, 9, 26-27 and 32 can be found on paragraph [0030] of the specification as originally filed.

### **Rejection under 35 U.S.C. § 102(e) over Gertner:**

In Sections 2-3 of the Office Action dated June 19, 2007, the Examiner has rejected claims 1, 2, 4-8 and 26 under 35 U.S.C. §102(e) as being anticipated by Gertner et al (U.S. Patent Pub. No. 2003/0060873). This rejection is respectfully traversed.

A claim is anticipated under 102(a) only if each and every element as set forth in the claim is found, either expressly or inherently, in a single prior art reference. Verdegaal Bros. V. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Applicants have amended claims 1 and 26 to exemplify that the metal ions strongly associate with the nucleic acid molecule to prevent general and spontaneous deposition of the metal ions on sites other than the nucleic acid molecule.

Gertner discloses methods for co-depositing biological molecules in a metallic matrix on a substrate. For example, Gertner discloses the co-depositing of drugs and metal on the surface of stents from implantation into patients. Using the methods disclosed in Gertner, the entire substrate surface is coated with the metal/nucleic acid co-deposition.

The present invention claims metal ions, such as palladium and stannous ions, that are specifically connected to the nucleic acid molecules. The nucleic acid molecule becomes the substrate for encasing the nucleic acid molecule in a metal coating. This allows for the specific metallization of nucleic acids without metal coating of surrounding surfaces. For example, the method can be utilized to coat DNA bridges on the surface of a

microelectronic chip to form connective wires between electrodes. The metal ions specifically bind to the DNA. The unbound metal ions are washed off of the chip. Metal, such as nickel, is then developed only over the DNA where the metal ions remain attached. Metal wires are formed along the DNA, while the remainder of the chip remains free from metal coating.

Gertner fails to disclose strongly connecting metal ions that bind to target nucleic acid molecules as claimed by the instant invention. Therefore, the reference fails to anticipate the instant claims. Claims 2 and 4-8 benefit from dependency on claim 1, which as discussed above, is patentable. Therefore, it is respectfully requested that this rejection be reconsidered and withdrawn.

**Rejection under 35 U.S.C. § 103(a) over Gertner in view of Tu:**

In Sections 4-6 of the Office Action dated June 19, 2007, the Examiner has rejected claim 3 under 35 U.S.C. §103(a) as being unpatentable over Gertner et al (U.S. Patent Pub. No. 2003/0060873) in view of Tu et al (U.S. Patent No. 5,945,527). This rejection is respectfully traversed.

As discussed above, Gertner fails to teach or suggest strongly connecting palladium ions that bind to target nucleic acid molecules as claimed by the instant invention. Tu disclose the use of a palladium catalyst, but fails to teach or suggest binding palladium ions to a nucleic acid molecule as claimed by the instant invention. Tu further fails to teach specifically binding palladium ions to a target nucleic acid molecule to prevent general and spontaneous deposition of the palladium ions. Therefore, it is respectfully requested that this rejection be reconsidered and withdrawn.

**Rejection under 35 U.S.C. § 103(a) over Fish in view of Gertner:**

In Section 7 of the Office Action dated June 19, 2007, the Examiner has rejected claims 9, 10, 12-25 and 27 under 35 U.S.C. §103(a) as being unpatentable over Fish (U.S. Patent Pub. No. 2004/0132220) in view of Gertner et al (U.S. Patent Pub. No. 2003/0060873). This rejection is respectfully traversed.

As discussed, above Gertner fails to teach or suggest strongly connecting metal ions that bind to target nucleic acid molecules as claimed by the instant invention. Fish further fails to teach this limitation. Fish discloses a method for detection of nucleic acid molecules electronically. Fish relies on electrically detecting a binding event without any additional modification of the nucleic acid molecule. By contrast, the instant invention

claims, contacting the target nucleic acid molecule with metal ions. Therefore, the references fail to teach or suggest all of the claimed limitations.

The proposed modification renders the prior art references inoperable. When a proposed modification renders the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Combining the method disclosed by Gertner in the electrode system of Fish would coat the entire system in metal. As the entire system would be coated in metal, the electrodes would short out making it impossible to detect target nucleic acid molecules. Therefore, as the proposed modification is inoperable there lacks any suggestion or motivation to make the proposed modification. Furthermore, even making the proposed modification neither reference teaches specifically binding the metal ions to nucleic acid molecules.

Claims 10 and 12-25 benefit from dependence on the independent claims of the instant invention, which as discussed above, are patentable. Therefore, it is respectfully requested that this rejection be reconsidered and withdrawn.

**Rejection under 35 U.S.C. § 103(a) over Fish in view of Gertner and Tu:**

In Section 8 of the Office Action dated June 19, 2007, the Examiner has rejected claim 11 under 35 U.S.C. §103(a) as being unpatentable over Fish (U.S. Patent Pub. No. 2004/0132220) in view of Gertner et al (U.S. Patent Pub. No. 2003/0060873) and further in view of Tu et al (U.S. Patent No. 5,945,527). This rejection is respectfully traversed.

As discussed above, neither Fish nor Gertner teaches or suggests strongly connecting metal ions that bind to target nucleic acid molecules as claimed by the instant invention. Furthermore, as discussed relating to claim 3 above, Tu fails to teach this limitation. Claim 11 benefits from dependency on claim 9, which as discussed above, is patentable. Therefore, it is respectfully requested that this rejection be reconsidered and withdrawn.

**Rejection under 35 U.S.C. § 103(a) over Fish in view of Zocchi:**

In Section 9 of the Office Action dated June 19, 2007, the Examiner has rejected claim 32 under 35 U.S.C. §103(a) as being unpatentable over Fish (U.S. Patent Pub. No. 2004/0132220) in view of Zocchi et al (U.S. Patent Pub. No. 2004/0241699). This rejection is respectfully traversed.

As discussed above, Fish fails to teach or suggest strongly connecting metal ions that bind to target nucleic acid molecules as claimed by the instant invention. Zocchi further fails to teach this limitation. Neither reference teaches or suggests specifically binding metal ions to nucleic acid molecules. Therefore, it is respectfully requested that this rejection be reconsidered and withdrawn.

**Examiner's Response to Arguments:**

In Section 10 of the Office Action dated June 19, 2007, the Examiner indicates that Applicant's arguments filed March 30, 2007 have been fully considered but they are not persuasive.

Regarding specific metallization of nucleic acids, Applicant's respectfully urge that the present amendments address the Examiner's contention. The instant claims are limited to metal ions that are strongly associated with a target nucleic acid molecule, which is not disclosed by the prior art references.


Regarding combining Gertner with Fish, as discussed above the proposed combination is inoperable, and therefore there lacks any motivation to make the proposed combination.

**Conclusion:**

It is believed that the foregoing is a complete response to the Office Action and that the claims are in condition for allowance. Consideration and allowance are respectfully requested.

Respectfully submitted,

Date: 9/19/07

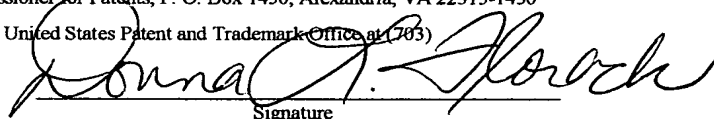
  
Dennis M. Connolly  
Registration No. 40,964

CERTIFICATE OF MAILING OR TRANSMISSION [37 CFR 1.8(a)]

I hereby certify that this correspondence is being:

- ☒ deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450
- ☐ transmitted by facsimile on the date shown below to the United States Patent and Trademark Office at (703)

9/19/07  
Date

  
Signature

Donna L. Florack  
Type or Print Name